

## **STANDARD OPERATING PROCEDURE NO. 4**

### **TIDE GAGE INSTALLATION**

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### **3.0 PURPOSE AND SCOPE**

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The purpose of this document is to define the standard operating procedure (SOP) for installation of a tide gage as part of the Newark Bay Study Area Remedial Investigation Work Plan (RIWP). This SOP describes the equipment, field procedures, materials, and documentation procedures necessary to install a tide gage. More specific information regarding the tide gage can be found in the IWP.

This SOP may change depending on field conditions, equipment limitations, or limitations imposed by the procedure. Substantive modification to this SOP shall be approved in advance by the Facility Coordinator (FC) (or Alternate FC) and the United States Environmental Protection Agency (USEPA) Remedial Project Manager. The ultimate procedure employed will be documented in the Newark Bay RI Report. SOP No. 1 – Field Documentation will also be utilized with this procedure.

## **4.0 PROCEDURES**

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### **4.1 EQUIPMENT LIST**

The following equipment list contains materials which may be needed in carrying out the procedures contained in this SOP. Not all equipment listed below may be necessary for a specific activity. Additional equipment may be required, pending field conditions.

- personal protective equipment (PPE) and other safety equipment, as required by RIWP Volume 3 (Tierra, 2005);
- navigation charts;
- appropriate equipment and hardware for installing the tide gage;
- tide gage;
- logbook; and
- permanent marker or grease pencil.

### **4.2 INSTALLATION PROCEDURES**

This section presents the general procedures for tide gage installation. Specific installation procedures will vary given the type of gage being installed, the location, and the structure to which the gage is being attached.

The tide gage will be a commercially available unit and will be installed according to the instructions provided by the manufacturer. A stilling well, or equivalent device, will be installed to minimize the effect of non-tidal water level fluctuation (induced by boat traffic or winds), if necessary.

Appropriate access authorization will be obtained prior to installing the tide gage to a bridge pier, bulkhead, or similar anchoring point. The gage will be secured to a bridge pier, bulkhead, or similar anchoring point so that the gage cannot be moved laterally or vertically. Following installation, the gage will be surveyed for vertical location from a third order benchmark or better (within 0.01-foot accuracy). The gage elevation will be established to 0.01 foot in the North American Vertical Datum of 1988 (NAVD88). The gage will also be surveyed for horizontal location (within 1-foot accuracy), established in the New Jersey State Plane Coordinate System, with respect to the North American Datum of 1983 (NAD83).

## **5.0 QUALITY ASSURANCE**

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Appropriate QA/QC procedures will be followed during surveying of each tide gage location and elevation, including use of horizontal and vertical control points. The survey work will meet a minimum of third order vertical accuracy for conventional traverse. A level loop and the closing error will be recorded. Benchmarks set will also be recorded. In addition, the following items shall be checked during the installation process:

- security of the mounting system, eliminating the possibility of gage movement;
- clock/time accuracy (referenced to EST); and
- setting of a time-mark on the tide gage (e.g., noting the exact time in the logbook that tide gage is placed in the water).

## **6.0 DOCUMENTATION**

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Field notes will be kept during installation activities in accordance with SOP No. 1 – Field Documentation. In addition, the following information should also be included in the logbook (at a minimum):

- Date and time of installation;
- Location of the gage in NJ State Plane Coordinates (feet), and brief description of the vicinity;
- For a pressure gage, record distance (feet) from the pressure transducer to the vertical datum;
- Specifications of gage;
- Installation method;
- Unusual conditions or problems with installation;
- Time that installation was completed; and
- Vertical datum and control points.

## **7.0 REFERENCES**

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Tierra. 2005. Newark Bay Study Area Remedial Investigation Work Plan. Volume 3 Health and Safety/Contingency Plan. September.